

1 **I CLAIM:**

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3 1. In the method of processing air prior to
4 separation of such air into gaseous components, the
5 steps that include:

6 a) first compressing a stream of air and
7 cooling the compressed air, to enable water separation
8 and removal from the stream, to provide a dry stream of
9 air,

10 b) then further compressing the dry air
11 stream and cooling the compressed dry air stream to
12 enable removal of contained remanent water,

13 c) then expanding the cooled air stream in
14 an expansion stage which extracts work from the
15 expanding stream,

16 d) then passing the expanded air stream to
17 a separator operating to remove water from the stream,
18 thereby producing dry air passed to a component gas
19 separation stage or stages.

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22 2. The method of claim 1 wherein said
23 expansion stage is provided by driving of a turbine.

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1 3. The method of claim 2 including
2 providing a booster compressor driven by the turbine
3 and operating to compress dried air at a booster
4 compression stage defined at sub-paragraph b) in claim
5 1.

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8 4. The method of claim 3 including
9 controllably passing compressed air to flow from the
10 discharge side of the booster compressor to the inlet
11 of the turbine, thereby by-passing said cooling step
12 and water removal step of sub-paragraph b) in claim 1.

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15 5. The method of claim 4 including
16 providing a flow control valve in the path of said by-
17 passing air flow.

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20 6. The method of claim 5 including
21 operating said valve to maintain the temperature of the
22 exhaust air from the turbine at or above about 5°C.

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1 7. The method of claim 1 including the step
2 of separating dried air into its component gases at
3 said air component separation stage.

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6 8. The method of claim 2 wherein the
7 turbine has air inlet nozzles, and including the step
8 of adjusting said nozzles to control air flow delivery
9 to said component gas separation stage.

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12 9. A system for processing air prior to
13 separation of the air into its gaseous components,
14 which comprises:

15 a) first means for compressing a stream of
16 air and cooling the compressed air, to enable water
17 separation and removal from the stream, to provide a
18 dry stream of air,

19 b) second means for then further
20 compressing the dry air stream and cooling the
21 compressed dry air stream to enable removal of
22 contained remanent water,

23 c) third means for then expanding the
24 cooled air stream in an expansion stage which extracts
25 work from the expanding stream,

1 d) fourth means for then passing the
2 expanded air stream to a separator operating to remove
3 water from the stream, thereby producing dry air passed
4 to a component gas separation stage or stages.

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7 10. The system of claim 9 including a
8 turbine defining said expansion stage, and a shaft for
9 transmitting power from the turbine to said first means
10 in the form of a booster compressor.

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